Measurement of the Total Active ^8B Solar Neutrino Flux at the Sudbury Neutrino Observatory with Enhanced Neutral Current Sensitivity[1]

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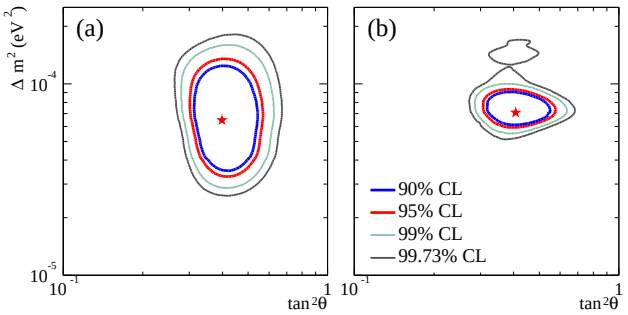

FIG. 1: Global neutrino oscillation contours. (a) Solar global: D_2O day and night spectra, salt CC, NC, ES fluxes, SK, Cl, Ga. The best-fit point is $\Delta m^2 = 6.5 \times 10^{-5}$, $\tan^2\theta = 0.40$, $f_B = 1.04$, with χ^2/d.o.f.=70.2/81. (b) Solar global + KamLAND. The best-fit point is $\Delta m^2 = 7.1 \times 10^{-5}$, $\tan^2\theta = 0.41$, $f_B = 1.02$. In both (a) and (b) the ^{8}B flux is free and the *hep* flux is fixed.

The Sudbury Neutrino Observatory (SNO) has precisely determined the total active (ν_x) ^{8}B solar neutrino flux without assumptions about the energy dependence of the ν_e survival probability. The measurements were made with dissolved NaCl in the heavy water to enhance the sensitivity and signature for neutral-current interactions. The flux is found to be 5.21 ± 0.27 (stat) ± 0.38 (syst) $\times 10^6$ cm^{-2}s^{-1}, in agreement with previous measurements and standard solar models. A global analysis of these and other solar and reactor neutrino results yields $\Delta m^2 = 7.1^{+1.2}_{-0.6} \times 10^{-5}$ eV^2 and $\theta = 32.5^{+2.4}_{-2.3}$ degrees. Maximal mixing is rejected at the equivalent of 5.4 standard deviations.

[1] TheSNOCollaboration, Phys. Rev. Lett. **92**, 181301 (2004).